

A Nuanced Approach to Nuclear Weapons Analysis

Jacques Hymans's excellent article, "When Does a State Become a 'Nuclear Weapon State?'" (17.1, March 2010, pp. 161–80), casts a fresh analytical eye on a classic international security dilemma: whether and when a state with a significant quantity (SQ) of fissile material, usually defined as several bombs' worth, should be considered a de facto nuclear weapon state in the absence of a test or other overt display of a viable weapon. I learned a great deal from the piece and offer the following observations as one who agrees with his conclusion.

In the process of unspooling his argument about the limits of the SQ/no-SQ frameworks, Hymans addresses the complicated question of Israel's opaque nuclear program and how it fits into the analysis of other threshold nuclear states, Iran being the most relevant today. He states that "it is questionable to assert that the Israeli posture of nuclear opacity is appealing to the new generation of nuclear weapon states." He goes on to cite the important work of Avner Cohen and others in the field, suggesting that Israel's case is unique and that it is "hard to imagine that other states would be eager to join Israel in this dubious club."

All of the reasons Hymans cites to substantiate this conclusion are compelling—other states once part of the "opaque club," such as North Korea, Pakistan, and South Africa, have for various reasons abandoned opacity either by relinquishing their weapons under international supervision, or testing a weapon and establishing without question their nuclear capability. He notes that Israel's opacity has "stunted doctrinal debate internally," led to its embarrassment internationally, and promoted the "cancerous growth of a secret state that undermines Israeli democracy."

While all of that may be true, I am not persuaded that Israel's example is in fact such a negative one for Iran, which appears (for now at least) intent on achieving an opaque nuclear

weapons capability, apparently having concluded that there are scant upsides but major downsides to actual testing. It is entirely possible that Iran will choose to keep any nuclear weapons entirely clandestine—risking the possibility of exposure to be sure, but calculating based in part on Israel's example that an opaque nuclear capability will bring it the regional power it seeks with far fewer negative consequences than the guarantee of isolation and war, should Iran test a weapon.

A second comment concerns the relevance of Hymans's conclusion—that states with civilian-led nuclear weapons complexes are more likely to test a weapon than those with military-led programs. It strikes me that attempting to distinguish between civilian and military entities is especially difficult in Iran, where the uranium enrichment program is clearly run by the civilian Atomic Energy Organization of Iran, while the International Atomic Energy Agency has identified clear ties between the nuclear program and military entities, and most Iran experts would note the overwhelming presence of the Iranian Revolutionary Guard Corps in all facets of such politically sensitive work. As an analytical tool for understanding Iran or predicting where it might go, I find the civilian-military distinction artificial and not terribly helpful. (I would add that the ten countries included in the article's table to illustrate this point constitute a rather small data set for teasing out meaningful conclusions regarding the civilian vs. military run programs.)

These observations are not intended to detract from Hymans's expertly argued, sensible thesis that rather than the test/no-test or the SQ/no-SQ debate, we should stick with the test/no-test indicator as the basic metric but "append an asterisk" to non-nuclear weapon states that have produced an SQ of fissile material based on the aptly named AHM (Assume the Hypothesis, Evaluate the Measure) approach of

Robert Adcock and David Collier. This certainly provides a more nuanced appreciation of a state's nuclear weapons capability and potential, and ample ground for pushing back against a dogmatic SQ/no-SQ metric, which is sure to

aggravate if not destabilize the nonproliferation regime.

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Removing a Roadblock to the U.S.-Russian Nuclear Reset

President Barack Obama has said that he wants to "reset" the U.S. relationship with Russia, which has deteriorated over the last decade. Obama clearly recognizes that U.S. and Russian national security are intertwined, perhaps more today than during the Cold War. All of Obama's goals in nuclear arms reduction, nuclear materials control, nonproliferation, and counterterrorism, among others, can be more readily achieved by a close partnership with Russia. As Russia scholar Robert Legvold noted in the July/August 2009 *Foreign Affairs*, "every tally of the ways in which Russia matters begins, and rightly so, with nuclear weapons." Unfortunately, the Obama administration may not be aware of how a relatively little-known nuclear cooperative program that failed may now stand as a roadblock to resetting the relationship.

The once-successful cooperative program was set in motion by a Presidential Decision Directive (PDD) issued by President Bill Clinton in the spring of 1996. I reviewed the process that followed Clinton's PDD in the November 2009 *Nonproliferation Review* (16.3, November 2009, pp. 483–507). Shortly after my essay was published, the complete text of the PDD was declassified and released to the general public by the

William J. Clinton Presidential Library, providing new insight into Clinton's motivation.

Clinton clearly recognized that close partnerships with Russia could enhance U.S. national security. In March 1996, he issued Presidential Decision Directive/NSC-47 (PDD-47) to establish and direct "the implementation of U.S. policy on nuclear scientific and technical cooperation with Russia related to stockpile safety and security and the Comprehensive Test Ban Treaty (CTBT) monitoring and verification." In the PDD, Clinton listed four major reasons why such cooperation was in the "U.S. national interest." It would:

- Contribute to a greater transparency and to the safe and secure maintenance and drawdown of the Russian nuclear stockpile during a period of political and economic transition in Russia, as well as the U.S. nuclear stockpile.
- Sustain the scientific competence of individuals responsible for ensuring confidence in the Russian and U.S. nuclear stockpiles.
- Facilitate achievement of other U.S. policy objectives, such as Russian agreement to and compliance with a true zero yield CTBT.

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- Further our understanding of Russia's nuclear weapons program.

The PDD listed approved "areas of cooperation and assistance" under the categories of "computations, experiments, and materials," "nuclear warhead safety and security," and "CTBT monitoring and verification." All "discussion and activities would be conducted only at the unclassified level and shall be consistent with the Atomic Energy Act. . . . Activities that have direct applications to nuclear weapon design or military performance enhancements of nuclear weapons shall be prohibited." Clinton recognized that Russia needed scientific and technical assistance if it were going to comply with the CTBT. The extent to which Clinton believed the United States should go to provide such assistance is perhaps best indicated by the inclusion on the approved list of "experiments on U.S. and Russian laser, pulsed power and hydrodynamic facilities." Even for areas not on the approved lists, Clinton allowed discussions "necessary to ensure that the Russian desires are fully understood."

The unclassified assistance under the PDD was intended to help Russia address the nuclear issues of most importance to Moscow—mainly, the safety and security of its nuclear arsenal. The first bullet point listed above shows that Clinton also recognized that such cooperation would also be important to U.S. nuclear arms reduction efforts, and the second reason shows that he expected U.S. nuclear weapons scientists to benefit from interactions with their Russian counterparts. Implicit in PDD-47 was the idea that cooperation in an area of supreme importance to Russia would naturally lead to cooperation of great importance to the United States but of lesser importance to Russia.

According to the PDD, it was issued following an August 11, 1995 letter in which Clinton "wrote President [Boris] Yeltsin regarding my decision to seek to negotiate a true, zero yield CTBT. In that letter, I told President Yeltsin that: 'We (the United States) are also interested in

expanding scientific and technical cooperation with Russia, including lab-to-lab contacts and collaboration on verification technologies.'"

The lab-to-lab relationships to which Clinton referred were the already-established, unclassified collaborations between the nuclear weapons laboratories of the United States and Russia. The labs established these relationships at the end of the Cold War, setting the stage for cooperation in an area of continually high importance to the United States: nuclear material protection, control, and accountability (MPC&A). In my *Nonproliferation Review* essay, I reviewed the origins of the most extensive of the lab-to-lab relationships: that between the Los Alamos National Laboratory (LANL) and the All-Russian Scientific Research Institute of Experimental Physics (VNIIEF)—the institutes that designed and developed the first nuclear weapons for their respective nations. I discussed how the LANL/VNIIEF collaboration, and others similar to it, were highly favored by the leaders of Russia's nuclear weapons complex: the minister and first deputy minister of atomic energy, the administrative and scientific directors of Russia's labs, and the leading scientists in the nuclear weapons program. In fact, there is anecdotal evidence that the fundamental scientific collaborations were the most favored of all U.S.-Russian cooperative nuclear programs; for example, in the late 1990s and early 2000s, collaboration participants continued to be permitted to visit Russia's closed nuclear weapons design laboratories, while essentially all other programs were being denied access as an expression of the Russian government's frustrations with the other cooperative programs.

In my essay, I traced how the Moscow Protocol Process (set in motion by PDD-47) led to high-level agreements for greatly expanded collaboration, agreements met with enthusiasm by the Russian leaders. However, in the decade that followed the PDD, U.S. assistance to Russia never reached a level that fulfilled U.S. promises and therefore never met the expectations of Russian leaders, disappointing and alienating them

and increasing the possibility of a return to nuclear weapons testing by Russia. I also detailed the reasons for the loss of U.S. credibility in the eyes of the leaders of Russia's nuclear weapons community—many of the same people who will lead any future U.S.-Russian nuclear partnership. In particular, I showed how essential elements of the relationship had disappeared, including recognition of Russian needs and reciprocal access to facilities, not to mention actual assistance.

With the release of PDD-47, we learn of Clinton's August 11, 1995 letter to Yeltsin, written at nearly the same time that the Department of Energy (DOE) was summarily rejecting a proposal for expanded U.S.-Russian cooperation submitted by Victor Mikhailov (Russian minister of atomic energy), Evgenni Velikov (vice president of the Russian Academy of Sciences), Radii I. Ilkaev (VNIIEF director), and Yuli B. Khariton (the founder of the Soviet nuclear weapons program). In an August 4, 1995 letter to U.S. Secretary of Energy Hazel O'Leary, Mikhailov wrote that U.S. acceptance of the proposal, which involved controlled thermonuclear fusion, would have provided "tangible evidence to the people of the U.S. and the Russian Federation that we have begun the process of converting our nuclear weapons design expertise to peaceful purposes." The rejection of the Russian proposal at the same time that Clinton was touting expanded cooperation surely sent a mixed message to Russia and led the Russian leaders to question U.S. credibility. Add to this major rejection the subsequent U.S. failure to follow through on high-level agreements that followed the PDD, and it is not surprising that Russian nuclear leaders now view any U.S. cooperative program with skepticism and suspicion.

The irony here is that the goals of PDD-47 could have been met for substantially less money than has been invested in each of the other U.S.-Russian nuclear cooperative programs and could potentially have brought the United States far more dividends. The total U.S. invest-

ment in projects conducted under the PDD was far less than \$10 million per year. At this level, substantial technical progress was made to the benefit of both nations, but, again, the investment was never large enough to meet the goals of the PDD.

In spite of the checkered history, there still remains an opportunity to use technical and scientific collaboration between the U.S. and Russian nuclear weapons labs to establish a basis for broader areas of collaboration with the Russian Federation. These areas have the potential to reduce the nuclear threat and contribute to U.S. national security. As Robert Legvold noted, "there is no logical reason why the two countries with the lion's share of the world's nuclear weapons cannot create a tighter regime to shrink their own arsenals and pave the way toward arrangements that render safer the programs of other nuclear powers."

The reasons set out in PDD-47 for such cooperation remain just as valid at the present. To set the stage for achieving President Obama's foreign policy objectives and to enhance the success of the nuclear-related working groups in the recently established Bilateral Presidential Commission, the administration can quickly begin to re-establish a spirit of partnership at relatively low cost simply by renewing the goals of the PDD and thereby opening the door to a wide spectrum of nuclear cooperation. Such cooperation could have been, and should have been, a part of the recent START negotiations, because confidence in the enduring stockpiles through scientific research is a necessary, albeit not sufficient, condition for stockpile reduction. Similarly, scientific confidence is a prerequisite for adherence to the CTBT, as Clinton recognized.

The first step is to restart and expand the existing scientific collaborations between the U.S. and Russian nuclear weapons design laboratories. These collaborations will address fundamental unclassified issues in the scientific underpinnings of stockpile stewardship, for example, allowing Russian scientists to design and conduct experiments at U.S. facilities such as the National Ignition Facility or the Z high-current

accelerator. A second example would be joint work in the controlled fusion approach previously proposed by the Russian leaders.

As Legvold and others have pointed out, the Obama administration needs a vision for building a strategic nuclear partnership with Russia. Because such a partnership is so critical to U.S. national security, this vision must be carried out by someone who has the full backing of the president and who can effectively coordinate and hold accountable the several U.S. government agencies involved. The scientific and technical cooperation envisioned in Clinton's PDD-47 must be a central part of the vision of a "reset" of U.S. interactions with Russia. The Obama administration must recognize that any U.S. initiative in this area will initially be met with Russian skepticism and suspicion of ulterior motives. Therefore, the administration must take care to fulfill its promises (real or implied) and be mindful of the unfortunate U.S. precedent of serious snubs and failures to keep commitments, a precedent unlikely to have been forgotten in Russia. Otherwise, the renewal of unclassified scientific and technical cooperation

in the nuclear arena is bound to suffer the same failure as in the past, making future cooperation much more difficult.

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Errata

In the March 2010 *Nonproliferation Review*, the article "The Nuclear Threshold States: Challenges and Opportunities Posed by Brazil and Argentina," stated that Japan was the first non-nuclear weapon state to sign the Additional Protocol. Rather, Japan was the first non-nuclear weapon state with an active civilian nuclear power program to sign and implement the Additional Protocol. The *Review* thanks John Carlson, director general of the Australian Safeguards and Non-Proliferation Office, for pointing out this detail, and Maria Rost Rublee for clarifying it.

In Memoriam

We are writing to commemorate and pay tribute to the life and accomplishments of Ambassador Stephen J. Ledogar, our friend and colleague, who lost his brave fight with cancer on May 3, 2010. We are a group of mainly arms control and nonproliferation professionals from several countries. At times, especially during the Cold War, some of us were in opposite political camps, fighting against each other's positions and defending our respective national security interests. Today, we are united by our common grief and sorrow, mourning the departure of a man whom we knew for years and who commanded our deepest respect.

Steve Ledogar was a great American, dedicated to the best interests of the United States and its national security, representing his country well and honorably. But beyond that, Steve was a citizen of the world, committed to the noble cause of international peace and security and to the well-being of the people of the world. In his important work, he demonstrated understanding of, and sensitivity to, the concerns of other nations and their representatives he faced across the negotiating table. In all that he did, Steve just "got it," a skill no better highlighted than in his delicate work at the Paris Peace talks, following earlier postings in Vietnam.

Coincidence or not, as Steve made his final departure, the 2010 Review Conference of the Treaty on the Non-Proliferation of Nuclear Weapons (NPT) was opening just across the Hudson River in the great hall of the UN General Assembly, where Steve spent many a day and night. In that great hall, one of the treaties Steve helped design and bring to conclusion, the Comprehensive Nuclear-Test-Ban Treaty (CTBT), was adopted and opened for signature. That treaty is critical to the implementation of Article VI of the NPT. Steve made other critical contributions to arms control, playing a pivotal role in ensuring successful negotiation and entry into force of the Chemical Weapons Convention, thus laying a foundation for a successful multilateral disarmament regime that verifiably prohibits a whole category of WMD. He also negotiated the framework for, and initiated negotiations on, the Treaty on Conventional Armed Forces in Europe. And, as a senior member of the U.S. delegation to the 1995 NPT Review Conference, he helped achieve the NPT's indefinite extension.

Steve never hesitated to take on a fight—with diplomatic opponents or within his own system—when he believed the cause to be just. He was not only a remarkable statesman, but also an all-around good man, as his wife, daughter, son, grandchildren, and many friends and colleagues can affirm.

Steve, who never missed a Tour de France, has bicycled out of our lives. We will miss him, particularly now as nuclear disarmament makes a comeback to the center stage of global politics, and as the United States engages in preparations to help bring the CTBT into force, including pursuit of its own ratification.

With great respect and admiration,

Yukiya Amano	Rafael Mariano Grossi	Robert Mikulak
Amb. Sergey Batsanov	Amb. Wolfgang Hoffmann	Amb. Johan Molander
Elisabet Borsiin Bonnier	John Holum	Amb. Roberto Garcia
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